

PATENT ABSTRACTS OF JAPAN

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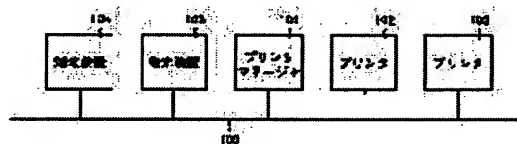
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(54) PRINTING SYSTEM

(57)Abstract:

PROBLEM TO BE SOLVED: To print the remaining part with another substitutive printer without wasting a part the printing of which has been finished until then when a fault is generation a printer under executing a printing job.

SOLUTION: This printing system is provided with a printer manager 101 which detects the generation of the fault in the printer under executing the printing job to select the substitutive printer representing the printer based a previously fixed countermeasure for the time of generating on a fault and transmits the printing job and information on pages the printer generating the fault already finishes printing to the substitutive printer, and plural printers 102 and 103 which receive the printing job and page information from the printer manager 101 when being selected as the representing printer and execute the following part of the already executed printing job. The printer manager 101 and the plural printers 102 and 103 are connected through a network 100.



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CLAIMS

[Claim(s)]

[Claim 1] While choosing the deputy printer which replaces said printer based on the countermeasures at the time of failure generating which detected that the failure occurred to the printer while performing a print job, and was beforehand set to it The printer management tool which transmits the page information to which the printer which said print job and said failure generated already ended printing to said deputy printer, The print system characterized by having the printer which performs a continuation of the print job which received said print job and said page information from said printer management tool, and was already performed based on said page information when chosen as said deputy printer.

[Claim 2] The print system characterized by choosing failure countermeasures beforehand from said two or more failure countermeasures before said printer management tool has memorized two or more failure countermeasures and a failure occurs to a printer while performing a print job in a print system according to claim 1.

[Claim 3] The print system characterized by notifying the abolition instruction of a print job to the printer concerned, and for said printer receiving advice of said abolition instruction, and discarding said print job in a print system according to claim 1 when a failure occurs to said printer while said printer management tool is performing printing.

DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[The technical field to which invention belongs] This invention chooses the deputy printer which replaces the printer which the failure generated when a failure occurs in a detail more about a print system at a printer while performing printing, and it is related with the print system which can continue printing without human being's inclusion.

[0002]

[Description of the Prior Art] Although countermeasures when the failure which cannot continue printing to a printer while performing printing occurs are indicated, there is JP,5-181621,A "a print control unit" as an example. This print control unit notifies by

telephone the operator who is not present in near of an error situation, when a failure occurs to a printer at the time of printing in a network.

[0003] Moreover, there is JP,6-187111,A "a print system" as other examples. This print system is a thing of the ability to make a print output from other deputy printers defined beforehand, when the printer planned as an output destination change is unusable.

[0004]

[Problem(s) to be Solved by the Invention] However, in some which were indicated by JP,5-181621,A, if through [human being canceled the failure of a printer, and made printing resume by the printer or printing by the printer was given up, and all documents needed to be reprinted by another printer and] human being after all, there was a problem that printing could not be resumed.

[0005] Moreover, in some which were indicated by JP,6-187111,A, since it is the method which reperforms printing by another printer when a failure occurs to a printer while performing printing, there is a problem that all the outputs to have completed printing by the first printer will become futility. Moreover, the approach of switching a print job, for example, the timing which switches a print job, is being fixed to another printer, and there was a problem that there was no room for a user to choose timing etc. as arbitration.

[0006] Therefore, it sets it as the 1st object having no inclusion of human being and to enable termination of a print job of this invention by not making useless a part to have completed printing by then, but printing the remainder by another deputy printer, when it is made in view of the above and a failure occurs to a printer while performing a print job.

[0007] Moreover, it sets it as the 2nd object to make the approach of starting a deputy printer selectable to arbitration.

[0008]

[Means for Solving the Problem] In order to attain the above-mentioned object, the print system concerning claim 1 of this invention While choosing the deputy printer which replaces said printer based on the countermeasures at the time of failure generating which detected that the failure occurred to the printer while performing a print job, and was beforehand set to it The printer management tool which transmits the page information to which the printer which said print job and said failure generated already ended printing to said deputy printer, When chosen as said deputy printer, said print job and said page information are received from said printer management tool, and it has the printer which performs a continuation of the already performed print job based

on said page information.

[0009] Moreover, in the print system according to claim 1, said printer management tool has memorized two or more failure countermeasures, and the print system concerning claim 2 of this invention chooses failure countermeasures beforehand from said two or more failure countermeasures, before a failure occurs to a printer while performing a print job.

[0010] Furthermore, when a failure generates the print system concerning claim 3 of this invention to said printer while said printer management tool is performing printing in a print system according to claim 1, the abolition instruction of a print job is notified to the printer concerned, and said printer receives advice of said abolition instruction, and discards said print job.

[0011]

[Embodiment of the Invention] Hereafter, the gestalt of the print system operation concerning this invention is explained to a detail, referring to a drawing.

[0012] Drawing 1 is the block diagram showing the outline configuration of the print system concerning the gestalt of operation of this invention. While the print system shown in drawing 1 chooses the deputy printer which replaces a printer based on the countermeasures at the time of failure generating which detected that the failure occurred to the printer while performing a print job, and was defined beforehand With the printer manager 101 as a printer management tool of this invention who transmits a print job and the page information to which the printer which the failure generated already ended printing to a deputy printer Two or more printers 102,103 which perform a continuation of the print job which received a print job and page information from the printer manager 101, and was already performed based on page information when chosen as a deputy printer, Through the network 100, it connects, respectively and a preparation, the printer manager 101, and two or more printers 102,103 are constituted.

[0013] Moreover, on the network 100, the terminal unit 104,105 equipped with applications, such as a word processor database, is connected, and the document by which printing processing is carried out by the print system of this invention is drawn up with these terminal units 104,105. In addition, the number of connection of a terminal unit and a printer is not limited to the number shown in drawing 1.

[0014] Two or more printers 102,103 which should be managed are beforehand registered into the printer manager 101. The printer manager 101 communicated with the registered printer 102,103, and always grasps in what kind of condition each printer 102,103 is now. And the printer manager 101 performs failure evasion processing mentioned later, when the failure which cannot continue printing to the printer under

print occurs, while receiving a print job from each terminal unit 104,105 and distributing this to a suitable printer.

[0015] The printer 102,103 is managed by one printer manager 101, and is registered by the printer manager 101 at the time of the setup of a printer. After registration, a printer 102,103 notifies that the power source was supplied to the printer manager 101, whenever a power source is switched on, and it can offer print service now. In addition, a printer 102,103 receives setting out of paper, a feeding and discarding paper tray, both sides, copy number of copies, etc. from the printer manager 101, and prints the content of printing (print data) defined by PDL data according to the setting out to media, such as paper. Moreover, when PDL data are given, a printing termination page can be specified for a printing initiation page to a printer 102,103. PDL data are Page about the content of printing (an alphabetic character, image) here. Description It is the thing of the data which Language defined.

[0016] A user creates a print job with a terminal unit 104,105, and hands the printer manager 101 a print job. Moreover, a user can receive examination of the progress situation of printing, selection of the countermeasures at the time of a failure, and service of advice of printing termination through the printer manager 101.

[0017] In addition, the above-mentioned print job is the combination of the PDL data mentioned above and print job setting out. It is the thing of the meeting of the data with which print job setting out defines selection of a printer, selection of paper or a feeding and discarding paper tray, setting out of double-sided printing, setting out of copy number of copies, selection of the deputy printer at the time of failure generating, selection of the countermeasures at the time of failure generating, etc. here. Selection of a deputy printer has the format which chooses a printer clearly, and the format which describes the algorithm which chooses deputy equipment from the printer group of arbitration.

[0018] Below, actuation of the print system concerning the gestalt of operation of this invention is divided into [actuation of a printer manager] and [actuation of a printer], and it explains at a detail.

[0019] [Actuation of printer manager] drawing 2 is a flow chart which shows the printer manager's 101 main routine in the print system concerning the gestalt of operation of this invention. A user draws up a document in a terminal unit 104,105 using applications, such as a word processor and a database. And when printing the document, the printer manager 101 is started and print job setting out is performed. Here, actuation of the printer manager 101 is explained in order of (the usual processing of a printer manager) and (processing of the printer manager at the time of failure

generating).

[0020] (The usual processing of a printer manager) The printer manager 101 displays the menu of print job setting out on a user's terminal unit 104,105 first (S201). A user can set up the countermeasures at the time of selection of a printer, selection of paper or a feeding-and-discarding paper tray, setting out of double-sided printing, setting out of copy number of copies, selection of the deputy printer at the time of failure generating, and failure generating on this menu.

[0021] in selection of a printer, all the printers that the printer manager 101 manages display on a menu -- having -- from this inside -- explicit -- a specific printer -- one set -- or two or more sets can be chosen. When only one printer is chosen, only the printer is used for printing. When two or more printers are chosen, the optimal printer is chosen by the printer manager 101 in the printer which can realize the conditions specified by print job setting out. Moreover, it is also possible not to choose a printer clearly, it is all the printers that the printer manager 101 manages in this case, and the printer optimal out of the printer which can realize the conditions specified by print job setting out is chosen.

[0022] Moreover, the printer manager 101 has memorized some kinds of countermeasures, such as "it does not carry out", "it changing to a deputy printer promptly", and "it changing to a deputy printer, if a failure is not solved after failure generating and within X part", as countermeasures at the time of failure generating, and displays these on a menu. A user can choose the countermeasures at the time of failure generating according to the significance of a print job.

[0023] About paper, a feeding-and-discarding paper tray, double-sided printing, and setting out of copy number of copies, since the list of the sum of the function of two or more available printers is displayed on a menu, a required function is chosen out of this. For example, when three sets of printers are available, two sets presuppose that double-sided printing is possible and double-sided printing of the one set cannot be carried out (when the specific printer is not chosen or three sets are chosen clearly). In this case, "double-sided printing" can be set up with a print job setting-out menu. However, when "double-sided printing" is chosen, the printer which cannot carry out double-sided printing is excepted from the object for selection.

[0024] One or more deputy printers are chosen from the printers which fulfill the conditions specified by print job setting out. Unless a failure occurs in activation of the print job in the printer chosen first, the printer manager 101 does not transmit a print job to a deputy printer.

[0025] In addition, in explanation of the gestalt of operation of this invention, there

shall be a printing demand, the printer 102 should be chosen from the terminal unit 104 in setting out of a print job as a printer which performs printing first, and the printer 103 should be chosen as a deputy printer.

[0026] The printer manager 101 will receive the document changed into PDL data from the terminal unit 104, if print job setting out is completed in step S201 (S202). The printer manager 101 combines print job setting out and PDL data, and manages with charge till termination of a print job.

[0027] The printer manager 101 chooses the printer which performs a print job based on print job setting out (S203). As mentioned above, one set of the printer which suits the conditions specified by one set of a specific printer and print job setting out chosen by the user is chosen. Here, a printer 102 is chosen.

[0028] The printer manager 101 judges whether the selected printer 102 can perform a print job (S204). If a printer 102 is in the condition that a print job can be performed, printer job setting out will be transmitted to a printer 102, and printer job setting out will be made to perform to a printer 102 (S207). With printer job setting out, setting out of selection of a printer and selection of a deputy printer is removed from print job setting out performed at step S201 here. That is, printer job setting out is the set of selection of paper or a feeding and discarding paper tray, setting out of double-sided printing, and setting out of copy number of copies.

[0029] On the other hand, when the selected printer 102 is in the condition that a print job cannot be performed, it judges whether a printer 102 is busy (S205). When busy, it waits to return to step S204 and to cancel a busy condition. It is not busy, printer another when a print job cannot be performed is chosen for a certain reason (S206), it returns to step S204, and processing is continued.

[0030] Then, the printer manager 101 receives the report of printer job setting out termination from a printer 102 (S208), and transmits PDL data to a printer 102 (S209).

[0031] And the printer manager 101 waits for the advice of printing termination from a printer 102 (S210). When advice of printing termination is received, while deleting the managed PDL data (S211), advice of job termination is transmitted to a terminal unit 104 (S212), and a job is ended.

[0032] Drawing 3 is a flow chart which shows the printer manager's 101 event processing routine. A printer manager receives advice (event) of the information about the present situation from a printer to the completion of printing, after 101 transmits PDL data to a printer at step S209 of drawing 2.

[0033] The printer manager 101 will judge whether it is that (failure generating report event) the event indicates it to be that the failure occurred to a printer, if an event is

received (S301). If it is not generating of a failure, the event will judge whether it is what shows the progress situation of the print job of a printer (progress situation report event) (S302).

[0034] Although a progress situation report event is explained to a detail in case it explains actuation of a printer, processing of PDL data is started, and whenever it delivers paper to one sheet of paper, it is transmitted from a printer, and Paige's number defined by PDL data, copy number of copies specified by printer job setting out are indicated. In addition, at the time of double-sided printing, the information on a table or a flesh side is also simultaneously indicated for printing having been completed.

[0035] The printer manager 101 displays this progress situation on the terminal screen of a terminal unit 104 while always grasping Paige and the copy number of sheets in which the progress situation sent from the printer 102 was recorded, and the printer 102 ended printing (S304). For example, when it is displayed as "printing termination number-of-sheets:X and; copy termination number-of-sheets:Y" and all the number of sheets and copy number of copies of a print job are known, anticipation end time is also displayed.

[0036] Then, the printer manager 101 receives advice of the completion of printing from a printer 102 (S305), notifies completion of printing to a terminal unit 104 (S306), and ends event processing.

[0037] In addition, in step S302 of drawing 3, when the event which received is not in a print job progress situation, other event processing is performed (S303). Since other event processing does not have direct relevance, it abbreviates the explanation to this invention here.

[0038] (Processing of the printer manager at the time of failure generating) Next, actuation when a failure occurs to a printer 102 is explained. In addition, with a failure, a paper jam, a form piece, etc. shall include all the cases where a printer cannot continue printing.

[0039] In step S301 of drawing 3, the printer manager 101 detects that the failure occurred to the printer from the event transmitted from the printer. Then, the printer manager 101 checks the countermeasures at the time of failure generating chosen by print job setting out. For example, when "it will change to a deputy printer promptly and will continue, if a failure occurs" is chosen as countermeasures at the time of failure generating, it progresses to step S308 and determines to start failure evasion processing. Moreover, for example, when "it will change to a deputy printer if a failure is not solved after failure generating and within X part" is chosen as countermeasures at the time of failure generating, a failure evasion timer is started at step S307, and it waits for

predetermined time amount and initiation of failure evasion processing.

[0040] The printer manager 101 after opting for initiation of failure evasion processing in step S308 notifies a job abolition instruction to the printer 102 which the failure generated (S309), and the remaining data are made not to be printed after a failure is canceled.

[0041] A continuation of return and failure evasion processing is explained to drawing 2. In step S213, the printer manager 101 determines a deputy printer based on print job setting out. Here, a printer 103 is used as a deputy printer.

[0042] The printer manager 101 judges whether the determined deputy printer 103 can perform a print job (S214). If the deputy printer 103 is in the condition that a print job can be performed, printer job setting out will be transmitted to the deputy printer 103, and printer job setting out will be performed (S217). With this printer job setting out, the flag which chooses "PDL data skip mode" as setting out sent to the printer which the failure generated, and the printer which the failure generated add the progress situation report event transmitted at the end. In addition, "PDL data skip mode" is a mode of operation of the printer mentioned later, and the printer which the failure generated is the mode in which it is made not to perform Paige's already printed printing processing with reference to the progress status-report event transmitted at the end. Moreover, it is displayed on the display screen of a terminal unit 104 that the deputy printer 103 was chosen.

[0043] On the other hand, when the determined deputy printer 103 is in the condition that a print job cannot be performed, in step S214, it judges whether the deputy printer 103 is busy (S215). When busy, it waits to return to step S214 and to cancel a busy condition. It is not busy, printer another when a print job cannot be performed is chosen for a certain reason (S216), it returns to step S214, and processing is continued.

[0044] Then, the printer manager 101 receives the report of the completion of printer job setting out from the deputy printer 103 (S218), and transmits PDL data to a deputy printer (S209). In addition, since the processing after PDL data transfer is as the term mentioned above (the usual processing of a printer manager) having explained, it omits the explanation here.

[0045] [actuation of a printer] -- continuing -- actuation of a printer -- (the usual processing) -- and (processing at the time of failure generating) (actuation of a deputy printer) it divides and explains. Drawing 4 is a flow chart which shows the main routine of a printer in the print system concerning the gestalt of operation of this invention.

[0046] (The usual processing) The printer 102 chosen by print job setting out receives printer job setting out transmitted by the printer manager 101, and changes own

setting out (S401).

[0047] A printer 102 judges whether the flag in "PDL data skip mode" exists in printer job setting out (S402). Here, it progresses to step S404 as that in which the flag in "PDL data skip mode" does not exist, and the report of printer job setting-out termination is transmitted to the printer manager 101.

[0048] And the PDL data transmitted by the printer manager 101 are received, and PDL data are processed for every Paige (S405). First, a page image is created based on PDL data (S406), and it prints on the recording paper (S408). Detection of that paper was delivered to the printed detail paper transmits a progress situation report event to the printer manager 101 (S410). (S409) That is, a progress status-report event is outputted to the printer manager 101, whenever it delivers paper to one sheet of paper.

[0049] Here, a progress situation report event is explained to a detail. A progress situation report event is written in the format of $P_n \cdot C_n \cdot S_n \cdot F_n \cdot T_n$. P_n is Paige's number defined by PDL data here, and C_n is a copy number-of-copies number. S_n is the number of the paper printed and consecutive numbers are attached to the sequence which a printer operates regardless of the page number or copy number of copies at paper. F_n is the number of Men of paper, for example, 1 displays [0] a flesh side with a table. T_n is the number of a paper output tray.

[0050] PDL data define the data to print in an order from eye 1 Paige. That is, the data for n Paige are located in a line with $P_1, P_2, P_3, \dots, P_n$, and these Paige is printed by Papers $S_1, S_2, S_3, \dots, S_n$ in this sequence. In addition, in double-sided printing, P_1 is printed by the table of S_1 and P_2 is printed by the flesh side of S_1 , respectively.

Therefore, it writes concretely $P_1 \cdot C_1 \cdot S_1 \cdot F_1 \cdot T_1, P_2 \cdot C_1 \cdot S_2 \cdot F_1 \cdot T_1,$

$P_3 \cdot C_1 \cdot S_3 \cdot F_1 \cdot T_1, \dots, P_n \cdot C_1 \cdot S_n \cdot F_1 \cdot T_1$ [a progress situation report event].

[0051] moreover, the case where it is the case (a sorter is used automatically) where copy number of copies of the m section is specified as print job setting out, and is one side printing -- $P_1 \cdot 1$ and $P \cdot 1 \cdot 2, P_1 \cdot 3, \dots, P_n \cdot m, P_2 \cdot 1, \dots, P \cdot 2 \cdot 2, P_2 \cdot 3, \dots, P_n \cdot m$ are printed by the paper of $S_1, S_2, S_3, \dots, S_{n \cdot m}$. Therefore, $P_1 \cdot C_1 \cdot S_1 \cdot F_1 \cdot T_1, P_1 \cdot C_2 \cdot S_2 \cdot F_1 \cdot T_2,$ a progress status-report event It is written as $\dots, P_1 \cdot C_m \cdot S_m \cdot F_1 \cdot T_m, P_2 \cdot C_1 \cdot S_{(m+1)} \cdot F_1 \cdot T_1, P_2 \cdot C_{(m+2)} \cdot S_1 \cdot F_1 \cdot T_2, \dots, P_1 \cdot C_m \cdot S_{(2m)} \cdot F_1 \cdot T_m.$

[0052] the case of double-sided printing -- $P \cdot 1 \cdot 1$ and $P_2 \cdot 1 \cdot 1$ and $P \cdot 1 \cdot 2$ and $P_2 \cdot 2 \cdot S_2$ and ... the page data of $P_{(n-1)} \cdot m, P_n \cdot m$ (when the number of n is even), or $P_n \cdot 1$ (when the number of n is odd) are printed by S_{nm} . Therefore, it writes $P_1 \cdot C_1 \cdot S_1 \cdot F_1 \cdot T_1, P_2 \cdot C_1 \cdot S_1 \cdot F_2 \cdot T_1, P_1 \cdot C_2 \cdot S_2 \cdot F_1 \cdot T_2, P_2 \cdot C_2 \cdot S_2 \cdot F_2 \cdot T_2,$ and \dots [a progress situation report event]

[0053] "That is, whenever [to which as for a printer, one sheet of paper is delivered] The c -th copy of the data of eye p Paige of PDL is printed on the s -th paper. It reports that paper was delivered to the paper output tray of No. t ", or "having printed the c -th copy of the data of eye p of PDL Paige, and eye $p+1$ Paige on the s -th paper, and having delivered paper to the paper output tray of No. t " to the printer manager 101. However, the notation approach of the above-mentioned progress situation report event is an example to the last, and the notation approach changes according to the mechanism of a printer, for example, the approach of double-sided printing.

[0054] A printer 102 judges whether PDL data are termination, after notifying a progress situation report event (S411). When PDL data are not completed, processing returned and mentioned above to step S405 is performed. On the other hand, when PDL data are completed, advice of job termination is transmitted to the printer manager 101 (S412), and a print job is ended.

[0055] (Processing at the time of failure generating) Next, actuation of the printer at the time of failure generating is explained as what the paper jam generated to the printer. If it detects that the paper jam generated the printer 102, a failure generating report event will be transmitted and it will notify that the failure occurred to the printer manager 101 (S413).

[0056] Then, when a failure is canceled, it progresses to step S408, and printing is continued (S414). On the other hand, when a failure is not canceled, it waits for the print job abolition instruction from the printer manager 101 (S415). When a print job abolition instruction is received, a printer 102 notifies the printer manager 101 of the purport which discarded the print job (S416), and ends a job while it cancels the print job interrupted according to the failure.

[0057] (Actuation of a deputy printer) As mentioned above, when a failure occurs to the printer 102 while performing a print job, the printer manager 101 determines a deputy printer according to print job setting out set up beforehand. The printer 103 determined as the deputy printer receives printer job setting out transmitted by the printer manager 101, and changes own setting out (S401). In addition, in addition to setting out sent to the printer 102 which the failure generated, the progress situation report event which the flag which chooses "PDL data skip mode", and the printer 102 which the failure generated have transmitted at the end is added and made this printer job setting out.

[0058] The deputy printer's 103 detection of the flag which chooses "PDL data skip mode" from printer job setting out sets up the skip page number according to the progress situation report event set as printer job setting out (S403). (S402) That is, it is

made not to perform printing processing which is Paige whom the printer 102 which the failure generated already printed by setting up the skip page number. Then, the deputy printer 103 notifies the purport which setting out completed to the printer manager 101 (S404).

[0059] Then, the PDL data transmitted by the printer manager 101 are received, and PDL data are processed for every Paige (S405). First, a page image is created based on PDL data (S406). Then, the skip page number set up with Paige who created the page image is compared (S407). For example, since printing is completed by the printer 102 which the failure already generated, the page image which the created page image created when the skip page number was set up with 3 Paige by eye 1 of PDL data Paige is not printed to the recording paper, but progresses to step S410, and performs a progress situation report.

[0060] On the other hand, since the page image created when the skip page number was set up with 3 Paige by eye 4 of PDL data Paige is not printed yet, after the page image created, for example prints to the recording paper (S408) and delivers paper to the recording paper (S409), it performs a progress situation report (S410). In actuation of the deputy printer 103, about actuation (the usual processing) (processing at the time of failure generating) of others including actuation when a failure occurs, since it is the same as that of what explained, the explanation is omitted.

[0061] In addition, when the printer 102 and the deputy printer 103 which the failure generated are the same model, since the deputy printer 103 can perform the same processing as the printer 102 which the failure generated, it can perform selection of a paper output tray, printing processing of a table and a flesh side, etc. satisfactory.

[0062] When it is the case where it is the model from which the printer 102 which the failure generated, and the deputy printer 103 differ on the other hand and copy number of copies is set as plurality by double-sided printing as print job setting out, the sequence printed by the printer may differ. In this case, the deputy printer 103 can avoid that several intermediate pages are not printed, even if the print stations of a printer differ by performing processing in which "the PDL data for an even-numbered page with which the printer which the failure generated ended processing thoroughly" is not printed not printing "the paper in which the printer which the failure generated ended printing."

[0063] Thus, according to the print system concerning the gestalt of operation of this invention, when a failure occurs to the printer 102 while performing a print job, termination of a print job can be enabled [having no inclusion of human being and] by not making useless a part to have completed printing by then, but printing the

remainder by another deputy printer 103. Moreover, since the countermeasures at the time of failure generating can be chosen from some kinds, such as "it does not carry out", "it changing to a deputy printer promptly", and "changing to a deputy printer if a failure is not solved after failure generating and within X part", they can choose the countermeasures at the time of failure generating according to the significance of a print job, and are dramatically convenient.

[0064]

[Effect of the Invention] As explained above, according to the print system (claim 1) concerning this invention While choosing the deputy printer which replaces a printer based on the countermeasures at the time of failure generating which detected that the failure occurred to the printer while performing a print job, and was beforehand set to it The printer management tool which transmits a print job and the page information to which the printer which the failure generated already ended printing to a deputy printer, Since it has the printer which performs a continuation of the print job which received a print job and page information from the printer management tool, and was already performed based on page information when chosen as a deputy printer, A print job can be completed by the deputy printer, without making useless a part to already have completed printing by the printer which the failure generated.

[0065] Moreover, according to the print system (claim 2) concerning this invention, in a print system according to claim 1, the printer management tool has memorized two or more failure countermeasures, before a failure occurs to a printer while performing a print job, it writes to choose failure countermeasures beforehand from two or more failure countermeasures, and it becomes possible to change the policy of failure evasion into arbitration.

[0066] Furthermore, according to the print system (claim 3) concerning this invention, it sets to a print system according to claim 1. When a failure occurs to a printer while a printer management tool is performing printing, notify the abolition instruction of a print job to the printer concerned, and a printer receives advice of an abolition instruction and writes to discard a print job. In spite of having made the deputy printer continue the remaining print jobs, after the failure of the printer which the failure generated is canceled, it can prevent that the same data are printed.

TECHNICAL FIELD

[The technical field to which invention belongs] This invention chooses the deputy printer which replaces the printer which the failure generated when a failure occurs in a detail more about a print system at a printer while performing printing, and it is related with the print system which can continue printing without human being's inclusion.

PRIOR ART

[Description of the Prior Art] Although countermeasures when the failure which cannot continue printing to a printer while performing printing occurs are indicated, there is JP,5-181621,A "a print control unit" as an example. This print control unit notifies by telephone the operator who is not present in near of an error situation, when a failure occurs to a printer at the time of printing in a network.

[0003] Moreover, there is JP,6-187111,A "a print system" as other examples. This print system is a thing of the ability to make a print output from other deputy printers defined beforehand, when the printer planned as an output destination change is unusable.

EFFECT OF THE INVENTION

[Effect of the Invention] As explained above, according to the print system (claim 1) concerning this invention While choosing the deputy printer which replaces a printer based on the countermeasures at the time of failure generating which detected that the failure occurred to the printer while performing a print job, and was beforehand set to it The printer management tool which transmits a print job and the page information to which the printer which the failure generated already ended printing to a deputy printer, Since it has the printer which performs a continuation of the print job which received a print job and page information from the printer management tool, and was already performed based on page information when chosen as a deputy printer, A print job can be completed by the deputy printer, without making useless a part to already have completed printing by the printer which the failure generated.

[0065] Moreover, according to the print system (claim 2) concerning this invention, in a print system according to claim 1, the printer management tool has memorized two or more failure countermeasures, before a failure occurs to a printer while performing a print job, it writes to choose failure countermeasures beforehand from two or more

failure countermeasures, and it becomes possible to change the policy of failure evasion into arbitration.

[0066] Furthermore, according to the print system (claim 3) concerning this invention, it sets to a print system according to claim 1. When a failure occurs to a printer while a printer management tool is performing printing, notify the abolition instruction of a print job to the printer concerned, and a printer receives advice of an abolition instruction and writes to discard a print job. In spite of having made the deputy printer continue the remaining print jobs, after the failure of the printer which the failure generated is canceled, it can prevent that the same data are printed.

TECHNICAL PROBLEM

[Problem(s) to be Solved by the Invention] However, in some which were indicated by JP,5-181621,A, if through [human being canceled the failure of a printer, and made printing resume by the printer or printing by the printer was given up, and all documents needed to be reprinted by another printer and] human being after all, there was a problem that printing could not be resumed.

[0005] Moreover, in some which were indicated by JP,6-187111,A, since it is the method which reperforms printing by another printer when a failure occurs to a printer while performing printing, there is a problem that all the outputs to have completed printing by the first printer will become futility. Moreover, the approach of switching a print job, for example, the timing which switches a print job, is being fixed to another printer, and there was a problem that there was no room for a user to choose timing etc. as arbitration.

[0006] Therefore, it sets it as the 1st object having no inclusion of human being and to enable termination of a print job of this invention by not making useless a part to have completed printing by then, but printing the remainder by another deputy printer, when it is made in view of the above and a failure occurs to a printer while performing a print job.

[0007] Moreover, it sets it as the 2nd object to make the approach of starting a deputy printer selectable to arbitration.

MEANS

[Means for Solving the Problem] In order to attain the above-mentioned object, the print system concerning claim 1 of this invention While choosing the deputy printer which replaces said printer based on the countermeasures at the time of failure generating which detected that the failure occurred to the printer while performing a print job, and was beforehand set to it The printer management tool which transmits the page information to which the printer which said print job and said failure generated already ended printing to said deputy printer, When chosen as said deputy printer, said print job and said page information are received from said printer management tool, and it has the printer which performs a continuation of the already performed print job based on said page information.

[0009] Moreover, in the print system according to claim 1, said printer management tool has memorized two or more failure countermeasures, and the print system concerning claim 2 of this invention chooses failure countermeasures beforehand from said two or more failure countermeasures, before a failure occurs to a printer while performing a print job.

[0010] Furthermore, when a failure generates the print system concerning claim 3 of this invention to said printer while said printer management tool is performing printing in a print system according to claim 1, the abolition instruction of a print job is notified to the printer concerned, and said printer receives advice of said abolition instruction, and discards said print job.

[0011]

[Embodiment of the Invention] Hereafter, the gestalt of the print system operation concerning this invention is explained to a detail, referring to a drawing.

[0012] Drawing 1 is the block diagram showing the outline configuration of the print system concerning the gestalt of operation of this invention. While the print system shown in drawing 1 chooses the deputy printer which replaces a printer based on the countermeasures at the time of failure generating which detected that the failure occurred to the printer while performing a print job, and was defined beforehand With the printer manager 101 as a printer management tool of this invention who transmits a print job and the page information to which the printer which the failure generated already ended printing to a deputy printer Two or more printers 102,103 which perform a continuation of the print job which received a print job and page information from the printer manager 101, and was already performed based on page information when chosen as a deputy printer, Through the network 100, it connects, respectively and a preparation, the printer manager 101, and two or more printers 102,103 are constituted.

[0013] Moreover, on the network 100, the terminal unit 104,105 equipped with applications, such as a word processor database, is connected, and the document by which printing processing is carried out by the print system of this invention is drawn up with these terminal units 104,105. In addition, the number of connection of a terminal unit and a printer is not limited to the number shown in drawing 1.

[0014] Two or more printers 102,103 which should be managed are beforehand registered into the printer manager 101. The printer manager 101 communicated with the registered printer 102,103, and always grasps in what kind of condition each printer 102,103 is now. And the printer manager 101 performs failure evasion processing mentioned later, when the failure which cannot continue printing to the printer under print occurs, while receiving a print job from each terminal unit 104,105 and distributing this to a suitable printer.

[0015] The printer 102,103 is managed by one printer manager 101, and is registered by the printer manager 101 at the time of the setup of a printer. After registration, a printer 102,103 notifies that the power source was supplied to the printer manager 101, whenever a power source is switched on, and it can offer print service now. In addition, a printer 102,103 receives setting out of paper, a feeding-and-discarding paper tray, both sides, copy number of copies, etc. from the printer manager 101, and prints the content of printing (print data) defined by PDL data according to the setting out to media, such as paper. Moreover, when PDL data are given, a printing termination page can be specified for a printing initiation page to a printer 102,103. PDL data are Page about the content of printing (an alphabetic character, image) here. Description It is the thing of the data which Language defined.

[0016] A user creates a print job with a terminal unit 104,105, and hands the printer manager 101 a print job. Moreover, a user can receive examination of the progress situation of printing, selection of the countermeasures at the time of a failure, and service of advice of printing termination through the printer manager 101.

[0017] In addition, the above-mentioned print job is the combination of the PDL data mentioned above and print job setting out. It is the thing of the meeting of the data with which print job setting out defines selection of a printer, selection of paper or a feeding-and-discarding paper tray, setting out of double-sided printing, setting out of copy number of copies, selection of the deputy printer at the time of failure generating, selection of the countermeasures at the time of failure generating, etc. here. Selection of a deputy printer has the format which chooses a printer clearly, and the format which describes the algorithm which chooses deputy equipment from the printer group of arbitration.

[0018] Below, actuation of the print system concerning the gestalt of operation of this invention is divided into [actuation of a printer manager] and [actuation of a printer], and it explains at a detail.

[0019] [Actuation of printer manager] drawing 2 is a flow chart which shows the printer manager's 101 main routine in the print system concerning the gestalt of operation of this invention. A user draws up a document in a terminal unit 104,105 using applications, such as a word processor and a database. And when printing the document, the printer manager 101 is started and print job setting out is performed. Here, actuation of the printer manager 101 is explained in order of (the usual processing of a printer manager) and (processing of the printer manager at the time of failure generating).

[0020] (The usual processing of a printer manager) The printer manager 101 displays the menu of print job setting out on a user's terminal unit 104,105 first (S201). A user can set up the countermeasures at the time of selection of a printer, selection of paper or a feeding-and-discarding paper tray, setting out of double-sided printing, setting out of copy number of copies, selection of the deputy printer at the time of failure generating, and failure generating on this menu.

[0021] in selection of a printer, all the printers that the printer manager 101 manages display on a menu -- having -- from this inside -- explicit -- a specific printer -- one set -- or two or more sets can be chosen. When only one printer is chosen, only the printer is used for printing. When two or more printers are chosen, the optimal printer is chosen by the printer manager 101 in the printer which can realize the conditions specified by print job setting out. Moreover, it is also possible not to choose a printer clearly, it is all the printers that the printer manager 101 manages in this case, and the printer optimal out of the printer which can realize the conditions specified by print job setting out is chosen.

[0022] Moreover, the printer manager 101 has memorized some kinds of countermeasures, such as "it does not carry out", "it changing to a deputy printer promptly", and "it changing to a deputy printer, if a failure is not solved after failure generating and within X part", as countermeasures at the time of failure generating, and displays these on a menu. A user can choose the countermeasures at the time of failure generating according to the significance of a print job.

[0023] About paper, a feeding-and-discarding paper tray, double-sided printing, and setting out of copy number of copies, since the list of the sum of the function of two or more available printers is displayed on a menu, a required function is chosen out of this. For example, when three sets of printers are available, two sets presuppose that

double-sided printing is possible and double-sided printing of the one set cannot be carried out (when the specific printer is not chosen or three sets are chosen clearly). In this case, "double-sided printing" can be set up with a print job setting-out menu. However, when "double-sided printing" is chosen, the printer which cannot carry out double-sided printing is excepted from the object for selection.

[0024] One or more deputy printers are chosen from the printers which fulfill the conditions specified by print job setting out. Unless a failure occurs in activation of the print job in the printer chosen first, the printer manager 101 does not transmit a print job to a deputy printer.

[0025] In addition, in explanation of the gestalt of operation of this invention, there shall be a printing demand, the printer 102 should be chosen from the terminal unit 104 in setting out of a print job as a printer which performs printing first, and the printer 103 should be chosen as a deputy printer.

[0026] The printer manager 101 will receive the document changed into PDL data from the terminal unit 104, if print job setting out is completed in step S201 (S202). The printer manager 101 combines print job setting out and PDL data, and manages with charge till termination of a print job.

[0027] The printer manager 101 chooses the printer which performs a print job based on print job setting out (S203). As mentioned above, one set of the printer which suits the conditions specified by one set of a specific printer and print job setting out chosen by the user is chosen. Here, a printer 102 is chosen.

[0028] The printer manager 101 judges whether the selected printer 102 can perform a print job (S204). If a printer 102 is in the condition that a print job can be performed, printer job setting out will be transmitted to a printer 102, and printer job setting out will be made to perform to a printer 102 (S207). With printer job setting out, setting out of selection of a printer and selection of a deputy printer is removed from print job setting out performed at step S201 here. That is, printer job setting out is the set of selection of paper or a feeding-and-discarding paper tray, setting out of double-sided printing, and setting out of copy number of copies.

[0029] On the other hand, when the selected printer 102 is in the condition that a print job cannot be performed, it judges whether a printer 102 is busy (S205). When busy, it waits to return to step S204 and to cancel a busy condition. It is not busy, printer another when a print job cannot be performed is chosen for a certain reason (S206), it returns to step S204, and processing is continued.

[0030] Then, the printer manager 101 receives the report of printer job setting-out termination from a printer 102 (S208), and transmits PDL data to a printer 102 (S209).

[0031] And the printer manager 101 waits for the advice of printing termination from a printer 102 (S210). When advice of printing termination is received, while deleting the managed PDL data (S211), advice of job termination is transmitted to a terminal unit 104 (S212), and a job is ended.

[0032] Drawing 3 is a flow chart which shows the printer manager's 101 event processing routine. A printer manager receives advice (event) of the information about the present situation from a printer to the completion of printing, after 101 transmits PDL data to a printer at step S209 of drawing 2.

[0033] The printer manager 101 will judge whether it is that (failure generating report event) the event indicates it to be that the failure occurred to a printer, if an event is received (S301). If it is not generating of a failure, the event will judge whether it is what shows the progress situation of the print job of a printer (progress situation report event) (S302).

[0034] Although a progress situation report event is explained to a detail in case it explains actuation of a printer, processing of PDL data is started, and whenever it delivers paper to one sheet of paper, it is transmitted from a printer, and Paige's number defined by PDL data, copy number of copies specified by printer job setting out are indicated. In addition, at the time of double-sided printing, the information on a table or a flesh side is also simultaneously indicated for printing having been completed.

[0035] The printer manager 101 displays this progress situation on the terminal screen of a terminal unit 104 while always grasping Paige and the copy number of sheets in which the progress situation sent from the printer 102 was recorded, and the printer 102 ended printing (S304). For example, when it is displayed as "printing termination number-of-sheets:X and; copy termination number-of-sheets:Y" and all the number of sheets and copy number of copies of a print job are known, anticipation end time is also displayed.

[0036] Then, the printer manager 101 receives advice of the completion of printing from a printer 102 (S305), notifies completion of printing to a terminal unit 104 (S306), and ends event processing.

[0037] In addition, in step S302 of drawing 3, when the event which received is not in a print job progress situation, other event processing is performed (S303). Since other event processing does not have direct relevance, it abbreviates the explanation to this invention here.

[0038] (Processing of the printer manager at the time of failure generating) Next, actuation when a failure occurs to a printer 102 is explained. In addition, with a failure, a paper jam, a form piece, etc. shall include all the cases where a printer cannot

continue printing.

[0039] In step S301 of drawing 3 , the printer manager 101 detects that the failure occurred to the printer from the event transmitted from the printer. Then, the printer manager 101 checks the countermeasures at the time of failure generating chosen by print job setting out. For example, when "it will change to a deputy printer promptly and will continue, if a failure occurs" is chosen as countermeasures at the time of failure generating, it progresses to step S308 and determines to start failure evasion processing. Moreover, for example, when "it will change to a deputy printer if a failure is not solved after failure generating and within X part" is chosen as countermeasures at the time of failure generating, a failure evasion timer is started at step S307, and it waits for predetermined time amount and initiation of failure evasion processing.

[0040] The printer manager 101 after opting for initiation of failure evasion processing in step S308 notifies a job abolition instruction to the printer 102 which the failure generated (S309), and the remaining data are made not to be printed after a failure is canceled.

[0041] A continuation of return and failure evasion processing is explained to drawing 2 . In step S213, the printer manager 101 determines a deputy printer based on print job setting out. Here, a printer 103 is used as a deputy printer.

[0042] The printer manager 101 judges whether the determined deputy printer 103 can perform a print job (S214). If the deputy printer 103 is in the condition that a print job can be performed, printer job setting out will be transmitted to the deputy printer 103, and printer job setting out will be performed (S217). With this printer job setting out, the flag which chooses "PDL data skip mode" as setting out sent to the printer which the failure generated, and the printer which the failure generated add the progress situation report event transmitted at the end. In addition, "PDL data skip mode" is a mode of operation of the printer mentioned later, and the printer which the failure generated is the mode in which it is made not to perform Paige's already printed printing processing with reference to the progress status-report event transmitted at the end. Moreover, it is displayed on the display screen of a terminal unit 104 that the deputy printer 103 was chosen.

[0043] On the other hand, when the determined deputy printer 103 is in the condition that a print job cannot be performed, in step S214, it judges whether the deputy printer 103 is busy (S215). When busy, it waits to return to step S214 and to cancel a busy condition. It is not busy, printer another when a print job cannot be performed is chosen for a certain reason (S216), it returns to step S214, and processing is continued.

[0044] Then, the printer manager 101 receives the report of the completion of printer job

setting out from the deputy printer 103 (S218), and transmits PDL data to a deputy printer (S209). In addition, since the processing after PDL data transfer is as the term mentioned above (the usual processing of a printer manager) having explained, it omits the explanation here.

[0045] [actuation of a printer] -- continuing -- actuation of a printer -- (the usual processing) -- and (processing at the time of failure generating) (actuation of a deputy printer) it divides and explains. Drawing 4 is a flow chart which shows the main routine of a printer in the print system concerning the gestalt of operation of this invention.

[0046] (The usual processing) The printer 102 chosen by print job setting out receives printer job setting out transmitted by the printer manager 101, and changes own setting out (S401).

[0047] A printer 102 judges whether the flag in "PDL data skip mode" exists in printer job setting out (S402). Here, it progresses to step S404 as that in which the flag in "PDL data skip mode" does not exist, and the report of printer job setting-out termination is transmitted to the printer manager 101.

[0048] And the PDL data transmitted by the printer manager 101 are received, and PDL data are processed for every Paige (S405). First, a page image is created based on PDL data (S406), and it prints on the recording paper (S408). Detection of that paper was delivered to the printed detail paper transmits a progress situation report event to the printer manager 101 (S410). (S409) That is, a progress status-report event is outputted to the printer manager 101, whenever it delivers paper to one sheet of paper.

[0049] Here, a progress situation report event is explained to a detail. A progress situation report event is written in the format of Pn-Cn-Sn-Fn-Tn. Pn is Paige's number defined by PDL data here, and Cn is a copy number-of-copies number. Sn is the number of the paper printed and consecutive numbers are attached to the sequence which a printer operates regardless of the page number or copy number of copies at paper. Fn is the number of Men of paper, for example, 1 displays [0] a flesh side with a table. Tn is the number of a paper output tray.

[0050] PDL data define the data to print in an order from eye 1 Paige. That is, the data for n Paige are located in a line with P1, P2, P3, ..., Pn, and these Paige is printed by Papers S1, S2, S3, ..., Sn in this sequence. In addition, in double-sided printing, P1 is printed by the table of S1 and P2 is printed by the flesh side of S1, respectively. Therefore, it writes concretely P1-C1-S1-F1-T1, P2-C1-S2-F1-T1, P3-C1-S3-F1-T1,, Pn-C1-Sn-F1-T1 [a progress situation report event].

[0051] moreover, the case where it is the case (a sorter is used automatically) where copy number of copies of the m section is specified as print job setting out, and is one

side printing -- $P1-1$ and $P \dots 1-2$, $P1-3$, and ... $Pn-m$, $P2-1$, and $P \dots$ page data called $2-2$, $P2-3$, ..., $Pn-m$ are printed by the paper of $S1$, $S2$, $S3$, ..., $Snxm$. Therefore, $P1-C1-S1-F1-T1$, $P1-C2-S2-F1-T2$, a progress status-report event It is written as, $P1-Cm-Sm-F1-Tm$, $P2-C1-S(m+1)-F1-T1$, $P2-C(m+2)-S1-F1-T2$,, $P1-Cm-S(2m)-F1-Tm$.

[0052] the case of double-sided printing -- $P \dots 1-1$ and $P2-1 \dots S1$ and $P \dots 1-2$ and $P2-2S2$ and ... the page data of $P(n-1)-m$, $Pn-m$ (when the number of n is even), or $Pn-1$ (when the number of n is odd) are printed by Snm . Therefore, it writes $P1-C1-S1-F1-T1$, $P2-C1-S1-F2-T1$, $P1-C2-S2-F1-T2$, $P2-C2-S2-F2-T2$, and [a progress situation report event]

[0053] "That is, whenever [to which as for a printer, one sheet of paper is delivered] The c -th copy of the data of eye p Paige of PDL is printed on the s -th paper. It reports that paper was delivered to the paper output tray of No. t ", or "having printed the c -th copy of the data of eye p of PDL Paige, and eye $p+1$ Paige on the s -th paper, and having delivered paper to the paper output tray of No. t " to the printer manager 101. However, the notation approach of the above-mentioned progress situation report event is an example to the last, and the notation approach changes according to the mechanism of a printer, for example, the approach of double-sided printing.

[0054] A printer 102 judges whether PDL data are termination, after notifying a progress situation report event (S411). When PDL data are not completed, processing returned and mentioned above to step S405 is performed. On the other hand, when PDL data are completed, advice of job termination is transmitted to the printer manager 101 (S412), and a print job is ended.

[0055] (Processing at the time of failure generating) Next, actuation of the printer at the time of failure generating is explained as what the paper jam generated to the printer. If it detects that the paper jam generated the printer 102, a failure generating report event will be transmitted and it will notify that the failure occurred to the printer manager 101 (S413).

[0056] Then, when a failure is canceled, it progresses to step S408, and printing is continued (S414). On the other hand, when a failure is not canceled, it waits for the print job abolition instruction from the printer manager 101 (S415). When a print job abolition instruction is received, a printer 102 notifies the printer manager 101 of the purport which discarded the print job (S416), and ends a job while it cancels the print job interrupted according to the failure.

[0057] (Actuation of a deputy printer) As mentioned above, when a failure occurs to the printer 102 while performing a print job, the printer manager 101 determines a deputy

printer according to print job setting out set up beforehand. The printer 103 determined as the deputy printer receives printer job setting out transmitted by the printer manager 101, and changes own setting out (S401). In addition, in addition to setting out sent to the printer 102 which the failure generated, the progress situation report event which the flag which chooses "PDL data skip mode", and the printer 102 which the failure generated have transmitted at the end is added and made this printer job setting out.

[0058] The deputy printer's 103 detection of the flag which chooses "PDL data skip mode" from printer job setting out sets up the skip page number according to the progress situation report event set as printer job setting out (S403). (S402) That is, it is made not to perform printing processing which is Paige whom the printer 102 which the failure generated already printed by setting up the skip page number. Then, the deputy printer 103 notifies the purport which setting out completed to the printer manager 101 (S404).

[0059] Then, the PDL data transmitted by the printer manager 101 are received, and PDL data are processed for every Paige (S405). First, a page image is created based on PDL data (S406). Then, the skip page number set up with Paige who created the page image is compared (S407). For example, since printing is completed by the printer 102 which the failure already generated, the page image which the created page image created when the skip page number was set up with 3 Paige by eye 1 of PDL data Paige is not printed to the recording paper, but progresses to step S410, and performs a progress situation report.

[0060] On the other hand, since the page image created when the skip page number was set up with 3 Paige by eye 4 of PDL data Paige is not printed yet, after the page image created, for example prints to the recording paper (S408) and delivers paper to the recording paper (S409), it performs a progress situation report (S410). In actuation of the deputy printer 103, about actuation (the usual processing) (processing at the time of failure generating) of others including actuation when a failure occurs, since it is the same as that of what explained, the explanation is omitted.

[0061] In addition, when the printer 102 and the deputy printer 103 which the failure generated are the same model, since the deputy printer 103 can perform the same processing as the printer 102 which the failure generated, it can perform selection of a paper output tray, printing processing of a table and a flesh side, etc. satisfactory.

[0062] When it is the case where it is the model from which the printer 102 which the failure generated, and the deputy printer 103 differ on the other hand and copy number of copies is set as plurality by double-sided printing as print job setting out, the

sequence printed by the printer may differ. In this case, the deputy printer 103 can avoid that several intermediate pages are not printed, even if the print stations of a printer differ by performing processing in which "the PDL data for an even-numbered page with which the printer which the failure generated ended processing thoroughly" is not printed not printing "the paper in which the printer which the failure generated ended printing."

[0063] Thus, according to the print system concerning the gestalt of operation of this invention, when a failure occurs to the printer 102 while performing a print job, termination of a print job can be enabled [having no inclusion of human being and] by not making useless a part to have completed printing by then, but printing the remainder by another deputy printer 103. Moreover, since the countermeasures at the time of failure generating can be chosen from some kinds, such as "it does not carry out", "it changing to a deputy printer promptly", and "changing to a deputy printer if a failure is not solved after failure generating and within X part", they can choose the countermeasures at the time of failure generating according to the significance of a print job, and are dramatically convenient.

DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] It is the block diagram showing the outline configuration of the print system concerning the gestalt of operation of this invention.

[Drawing 2] In the print system concerning the gestalt of operation of this invention, it is the flow chart which shows a printer manager's main routine.

[Drawing 3] In the print system concerning the gestalt of operation of this invention, it is the flow chart which shows a printer manager's event processing routine.

[Drawing 4] In the print system concerning the gestalt of operation of this invention, it is the flow chart which shows the main routine of a printer.

[Description of Notations]

100 Network

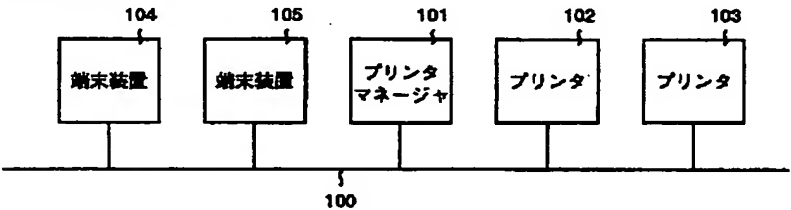
101 Printer Manager

102,103 Printer

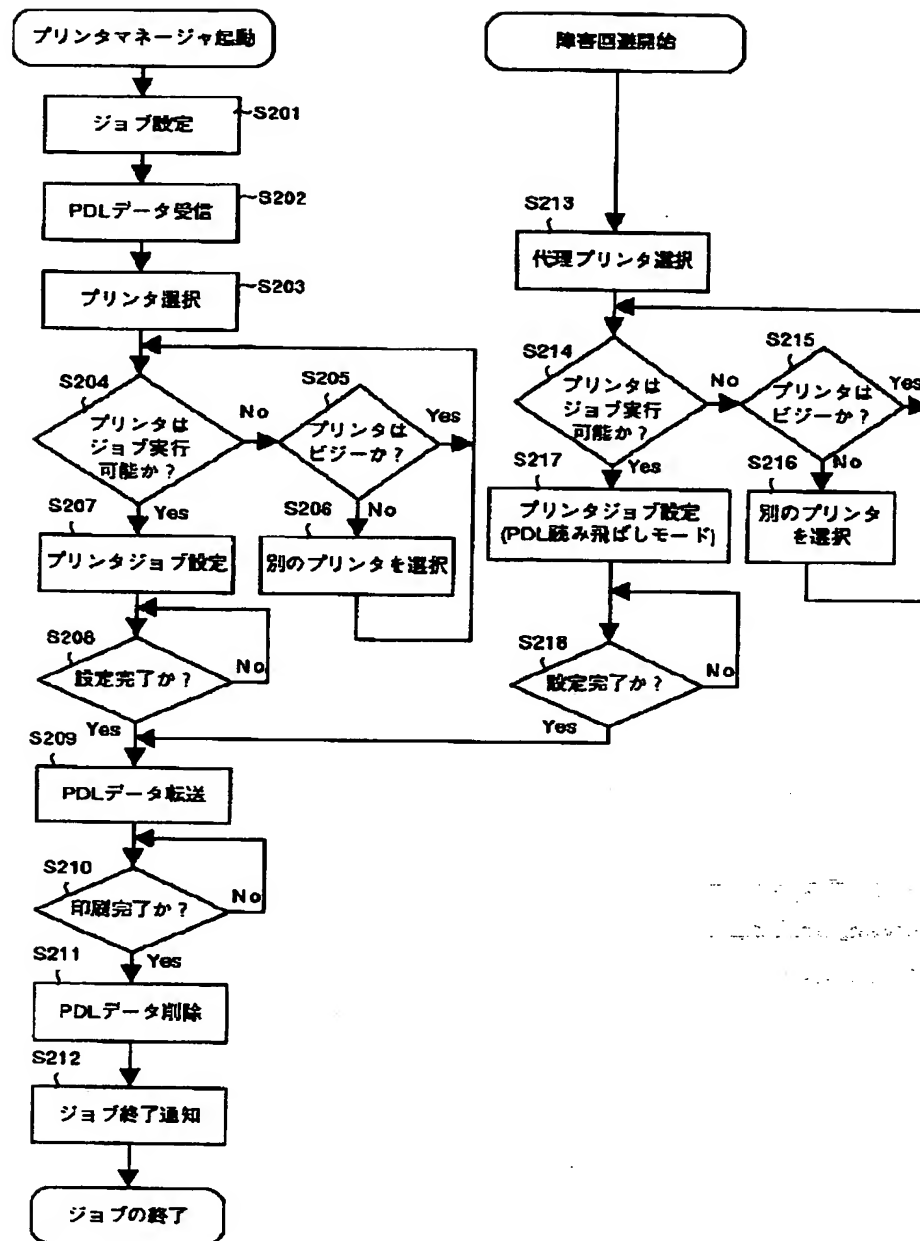
104,105 Terminal unit

DRAWINGS

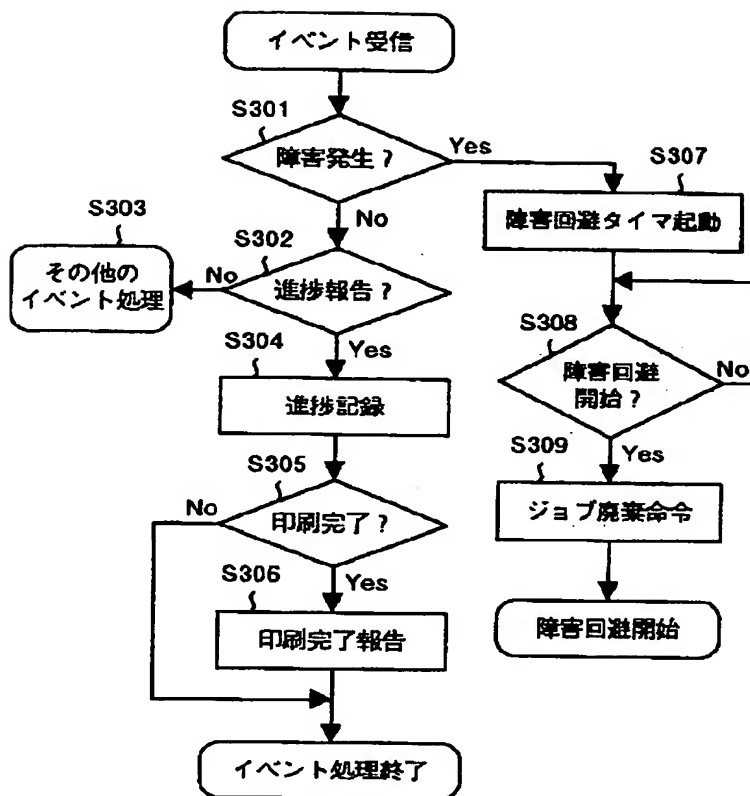
[Drawing 1]



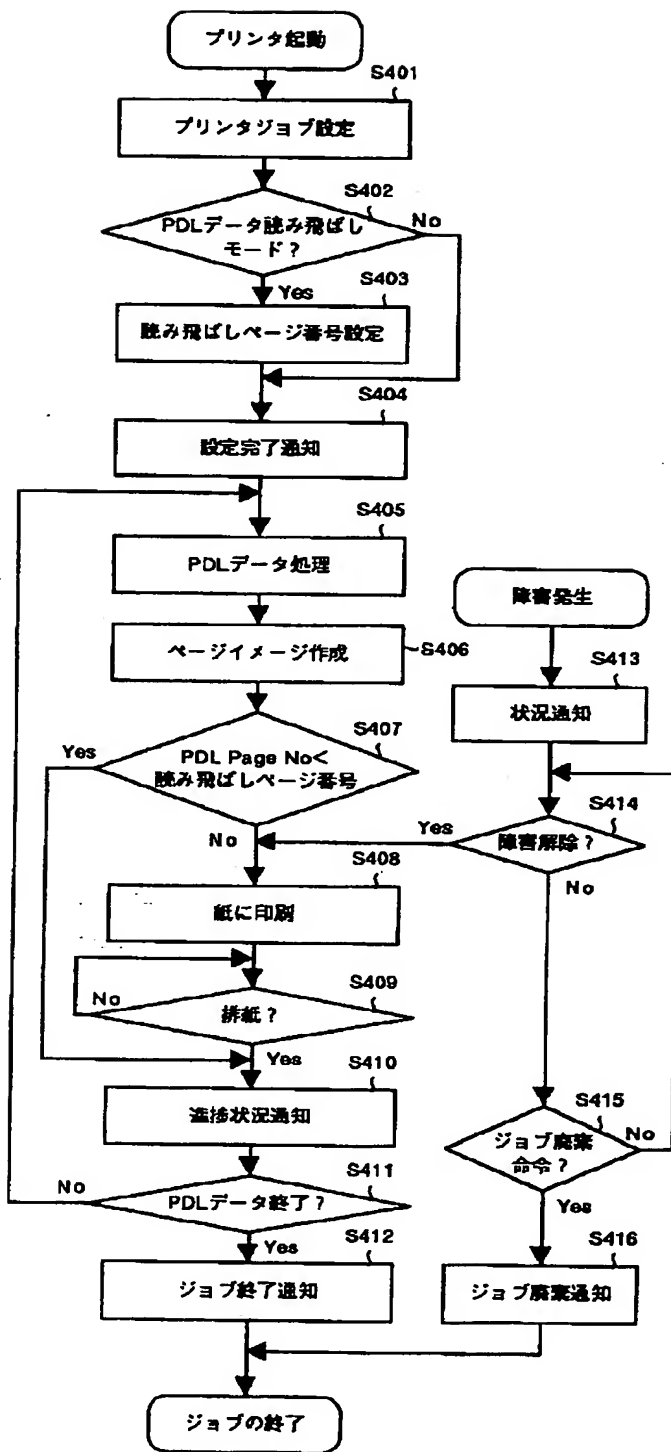
[Drawing 2]



[Drawing 3]



[Drawing 4]



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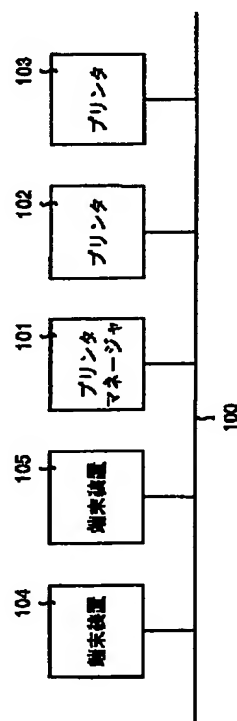
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(54) 【発明の名称】 プリントシステム

(57) 【要約】

【課題】 印刷ジョブを実行中のプリンタに障害が発生した場合、それまでに印刷が終了した分を無駄にせず、残りを別の代理プリンタで印刷する。

【解決手段】 本発明に係るプリントシステムは、印刷ジョブを実行中のプリンタに障害が発生したことを検知し、予め定めた障害発生時の対応策に基づいてプリンタに代わる代理プリンタを選択すると共に、代理プリンタに対して印刷ジョブと障害が発生したプリンタが既に印刷を終了したページ情報とを送信するプリンタマネージャ101と、代理プリンタとして選択された場合、プリンタマネージャ101から印刷ジョブとページ情報とを受信し、ページ情報に基づいて、既に実行された印刷ジョブの続きを実行する複数のプリンタ102、103と、を備え、プリンタマネージャ101と複数のプリンタ102、103とはネットワーク100を介してそれぞれ接続されて構成されている。



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【特許請求の範囲】

【請求項1】 印刷ジョブを実行中のプリンタに障害が発生したことを検知し、予め定めた障害発生時の対応策に基づいて前記プリンタに代わる代理プリンタを選択すると共に、前記代理プリンタに対して前記印刷ジョブと前記障害が発生したプリンタが既に印刷を終了したページ情報とを送信するプリンタ管理手段と、前記代理プリンタとして選択された場合、前記プリンタ管理手段から前記印刷ジョブと前記ページ情報とを受信し、前記ページ情報に基づいて、既に実行された印刷ジョブの続きを実行するプリンタと、を備えることを特徴とするプリントシステム。

【請求項2】 請求項1記載のプリントシステムにおいて、前記プリンタ管理手段が、複数の障害対応策を記憶しており、印刷ジョブを実行中のプリンタに障害が発生する前に前記複数の障害対応策の中から障害対応策を予め選択しておくことを特徴とするプリントシステム。

【請求項3】 請求項1記載のプリントシステムにおいて、前記プリンタ管理手段が、印刷を実行中の前記プリンタに障害が発生した場合、当該プリンタに対して印刷ジョブの廃棄命令を通知し、前記プリンタが、前記廃棄命令の通知を受信し、前記印刷ジョブを廃棄することを特徴とするプリントシステム。

【発明の詳細な説明】

【0001】

【発明が属する技術分野】本発明はプリントシステムに関し、より詳細には、印刷を実行中のプリンタに障害が発生した場合、障害が発生したプリンタに代わる代理プリンタを選択し、人間の介入なしに印刷を続行することが可能なプリントシステムに関する。

【0002】

【従来の技術】印刷を実行中のプリンタに印刷が続行不可能な障害が発生した場合の対応策を開示するものの例として、特開平5-181621号公報『印刷制御装置』がある。この印刷制御装置は、ネットワークでの印刷時においてプリンタに障害が発生した場合、近くにいないオペレータに電話でエラー状態を通知するというものである。

【0003】また、他の例として特開平6-187111号公報『プリントシステム』がある。このプリントシステムは、出力先として予定されていたプリンタが使用不可能である場合、予め定められた他の代理プリンタから印刷物を出力させることができるというものである。

【0004】

【発明が解決しようとする課題】しかしながら、特開平5-181621号公報に開示されたものでは、人間がプリンタの障害を解除し、そのプリンタで印刷を再開させるか、そのプリンタでの印刷をあきらめて別のプリンタで文書を全て印刷し直す必要があり、結局人間を介さなければ印刷を再開することができないという問題があ

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った。

【0005】また、特開平6-187111号公報に開示されたものでは、印刷を実行中のプリンタに障害が発生した場合に別のプリンタで印刷を実行し直す方式であるため、最初のプリンタで印刷が終了した分の出力が全て無駄になってしまうという問題がある。また、別のプリンタに印刷ジョブを切り換える方法、例えば印刷ジョブを切り換えるタイミング等が固定されており、ユーザが任意にタイミング等を選択する余地がないという問題があった。

【0006】したがって、本発明は上記に鑑みてなされたものであって、印刷ジョブを実行中のプリンタに障害が発生した場合、それまでに印刷が終了した分を無駄にせず、残りを別の代理プリンタで印刷することによって、人間の介入なしで印刷ジョブを終了可能にすることを第1の目的とする。

【0007】また、代理プリンタを起動する方法を任意に選択可能にすることを第2の目的とする。

【0008】

【課題を解決するための手段】上記目的を達成するため、本発明の請求項1に係るプリントシステムは、印刷ジョブを実行中のプリンタに障害が発生したことを検知し、予め定めた障害発生時の対応策に基づいて前記プリンタに代わる代理プリンタを選択すると共に、前記代理プリンタに対して前記印刷ジョブと前記障害が発生したプリンタが既に印刷を終了したページ情報とを送信するプリンタ管理手段と、前記代理プリンタとして選択された場合、前記プリンタ管理手段から前記印刷ジョブと前記ページ情報とを受信し、前記ページ情報に基づいて、既に実行された印刷ジョブの続きを実行するプリンタとを備えるものである。

【0009】また、本発明の請求項2に係るプリントシステムは、請求項1記載のプリントシステムにおいて、前記プリンタ管理手段が、複数の障害対応策を記憶しており、印刷ジョブを実行中のプリンタに障害が発生する前に前記複数の障害対応策の中から障害対応策を予め選択しておくものである。

【0010】更に、本発明の請求項3に係るプリントシステムは、請求項1記載のプリントシステムにおいて、前記プリンタ管理手段が、印刷を実行中の前記プリンタに障害が発生した場合、当該プリンタに対して印刷ジョブの廃棄命令を通知し、前記プリンタが、前記廃棄命令の通知を受信し、前記印刷ジョブを廃棄するものである。

【0011】

【発明の実施の形態】以下、本発明に係るプリントシステム実施の形態を図面を参照しつつ詳細に説明する。

【0012】図1は、本発明の実施の形態に係るプリントシステムの概略構成を示す構成図である。図1に示すプリントシステムは、印刷ジョブを実行中のプリンタに

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障害が発生したことを検知し、予め定めた障害発生時の対応策に基づいてプリンタに代わる代理プリンタを選択すると共に、代理プリンタに対して印刷ジョブと障害が発生したプリンタが既に印刷を終了したページ情報とを送信する本発明のプリンタ管理手段としてのプリンタマネージャ101と、代理プリンタとして選択された場合、プリンタマネージャ101から印刷ジョブとページ情報とを受信し、ページ情報に基づいて、既に実行された印刷ジョブの続きを実行する複数のプリンタ102、103と、を備え、プリンタマネージャ101と複数のプリンタ102、103とはネットワーク100を介してそれぞれ接続されて構成されている。

【0013】また、ネットワーク100上には、ワープロ・データベース等のアプリケーションを備えた端末装置104、105が接続されており、本発明のプリントシステムで印刷処理される文書等はこれらの端末装置104、105で作成される。なお、端末装置及びプリンタの接続数は、図1に示す数に限定されるものではない。

【0014】プリンタマネージャ101には、管理すべき複数のプリンタ102、103が予め登録されている。プリンタマネージャ101は、登録されたプリンタ102、103と通信し、各プリンタ102、103が現在どのような状態にあるのかを常に把握している。そしてプリンタマネージャ101は、各端末装置104、105から印刷ジョブを受け付け、これを適切なプリンタに分配すると共に、プリント中のプリンタに印刷を続行することができない障害が発生した場合、後述する障害回避処理を実行する。

【0015】プリンタ102、103は、1つのプリンタマネージャ101によって管理されており、プリンタのセットアップ時にプリンタマネージャ101に登録される。登録後、プリンタ102、103は、電源が投入される毎にプリンタマネージャ101に電源が投入されたことを通知し、プリントサービスを提供できるようになる。なお、プリンタ102、103は、プリンタマネージャ101から紙、給排紙トレイ、両面、コピー部数等の設定を受け付け、その設定に従ってPDLデータで定義される印刷内容（印刷データ）を紙等のメディアに印刷する。また、PDLデータが与えられるときに、プリンタ102、103に対して印刷開始頁を印刷終了頁を指定することができる。ここでPDLデータとは、印刷内容（文字、画像）をPage Description Languageで定義したデータのことであり、

【0016】ユーザは端末装置104、105で印刷ジョブを作成し、プリンタマネージャ101に印刷ジョブを渡す。また、ユーザは、プリンタマネージャ101を介して印刷の進捗状況の調査、障害時の対応策の選択、印刷終了の通知のサービスを受けることができる。

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【0017】なお、上記印刷ジョブとは、上述したPDLデータと印刷ジョブ設定の組み合わせである。ここに印刷ジョブ設定とは、プリンタの選択、紙や給排紙トレイの選択、両面印刷の設定、コピー部数の設定、障害発生時の代理プリンタの選択、障害発生時の対応策の選択等を定義するデータの集まりのことである。代理プリンタの選択は、プリンタを明示的に選択する形式と、任意のプリンタ群から代理装置を選択するアルゴリズムを記述する形式とがある。

【0018】以下に、本発明の実施の形態に係るプリントシステムの動作を「プリンタマネージャの動作」と「プリンタの動作」に分けて詳細に説明する。

【0019】「プリンタマネージャの動作」図2は、本発明の実施の形態に係るプリントシステムにおいて、プリンタマネージャ101のメインルーチンを示すフローチャートである。ユーザは端末装置104、105において、ワープロ、データベース等のアプリケーションを用いて文書を作成する。そして、その文書を印刷する場合にプリンタマネージャ101を起動して印刷ジョブ設定を行う。ここでは、（プリンタマネージャの通常の処理）、（障害発生時のプリンタマネージャの処理）の順でプリンタマネージャ101の動作を説明する。

【0020】（プリンタマネージャの通常の処理）まず、プリンタマネージャ101は、印刷ジョブ設定のメニューをユーザの端末装置104、105に表示する（S201）。ユーザは、このメニュー上でプリンタの選択、紙や給排紙トレイの選択、両面印刷の設定、コピー部数の設定、障害発生時の代理プリンタの選択、障害発生時の対応策を設定することができる。

【0021】プリンタの選択においては、プリンタマネージャ101が管理する全てのプリンタがメニュー上に表示され、この中から明示的に特定のプリンタを1台又は複数台選択することができる。プリンタを1台だけ選択した場合は、そのプリンタのみが印刷に使用される。プリンタを複数台選択した場合は、印刷ジョブ設定で指定された条件を実現可能なプリンタの中で最適なプリンタがプリンタマネージャ101によって選択される。また、プリンタを明示的に選択しないことも可能であり、この場合はプリンタマネージャ101が管理する全てのプリンタであって、印刷ジョブ設定で指定された条件を実現可能なプリンタの中から最適なプリンタが選択される。

【0022】また、プリンタマネージャ101は、障害発生時の対応策として「しない」、「直ちに代理プリンタに切り替える」、「障害発生後、X分以内に障害が解決されなかったら代理プリンタに切り替える」等の数種類の対応策を記憶しており、これらをメニュー上に表示する。ユーザは、印刷ジョブの重要度に合わせて障害発生時の対応策を選択することができる。

【0023】紙、給排紙トレイ、両面印刷、コピー部数

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の設定については、利用可能な複数のプリンタの機能の和のリストがメニュー上に表示されるため、この中から必要な機能が選択される。例えば3台のプリンタが利用可能である場合において（特定のプリンタが選択されていないか、3台が明示的に選択されている場合）、2台が両面印刷が可能で1台が両面印刷できないとする。この場合は印刷ジョブ設定メニューで「両面印刷」を設定することができる。ただし、「両面印刷」を選択した時点で両面印刷できないプリンタは選択対象から除外される。

【0024】代理プリンタは、印刷ジョブ設定で指定された条件を満たすプリンタの中から1台以上選択される。最初に選択されたプリンタでの印刷ジョブの実行に障害が発生しない限り、プリンタマネージャ101は代理プリンタに印刷ジョブを転送することはない。

【0025】なお、本発明の実施の形態の説明においては、端末装置104から印刷要求があり、印刷ジョブの設定において、最初に印刷を実行するプリンタとしてプリンタ102が選択され、代理プリンタとしてプリンタ103が選択されたものとする。

【0026】プリンタマネージャ101は、ステップS201において印刷ジョブ設定が完了すると、端末装置104からPDLデータに変換された文書を受信する（S202）。プリンタマネージャ101は、印刷ジョブ設定とPDLデータとを組み合わせ、印刷ジョブの終了まで責任を持って管理する。

【0027】プリンタマネージャ101は、印刷ジョブ設定に基づいて、印刷ジョブを実行させるプリンタを選択する（S203）。上述したように、ユーザによって選択された特定の1台のプリンタ又は印刷ジョブ設定で指定された条件に適合する1台のプリンタが選択される。ここではプリンタ102が選択される。

【0028】プリンタマネージャ101は、選択したプリンタ102が印刷ジョブを実行可能かを判断する（S204）。プリンタ102が印刷ジョブを実行可能な状態にあれば、プリンタ102に対してプリンタジョブ設定を送信し、プリンタ102にプリンタジョブ設定を行わせる（S207）。ここでプリンタジョブ設定とは、ステップS201で行った印刷ジョブ設定からプリンタの選択と代理プリンタの選択の設定を除いたものである。すなわち、プリンタジョブ設定は、紙や給排紙トレイの選択、両面印刷の設定、コピー部数の設定の集合である。

【0029】一方、選択したプリンタ102が印刷ジョブを実行することができない状態にある場合は、プリンタ102がビジーであるかを判断する（S205）。ビジーである場合は、ステップS204に戻ってビジー状態が解消されるのを待つ。ビジーではなく、何らかの理由により印刷ジョブを実行不可能である場合は、別のプリンタを選択し（S206）、ステップS2

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04に戻って処理を続行する。

【0030】続いてプリンタマネージャ101は、プリンタ102からプリンタジョブ設定終了の報告を受け（S208）、プリンタ102に対しPDLデータを転送する（S209）。

【0031】そして、プリンタマネージャ101は、プリンタ102からの印刷終了通知を待つ（S210）。印刷終了通知を受信した場合は、管理しているPDLデータを削除すると共に（S211）、端末装置104に対してジョブ終了の通知を送信し（S212）、ジョブを終了する。

【0032】図3は、プリンタマネージャ101のイベント処理ルーチンを示すフローチャートである。プリンタマネージャは101は、図2のステップS209でPDLデータをプリンタに送信してから印刷完了まで、プリンタから現在の状況に関する情報の通知（イベント）を受ける。

【0033】プリンタマネージャ101は、イベントを受信すると、そのイベントがプリンタに障害が発生したことを示すもの（障害発生報告イベント）か否かを判断する（S301）。障害の発生でなければ、そのイベントがプリンタの印刷ジョブの進捗状況を示すもの（進捗状況報告イベント）か否かを判断する（S302）。

【0034】進捗状況報告イベントとは、プリンタの動作を説明する際に詳細に説明するが、PDLデータの処理を開始し、紙を1枚排紙する度にプリンタから送信されるものであって、PDLデータで定義されたページの番号、プリンタジョブ設定で指定されたコピー部数等が記載されたものである。なお、両面印刷時には、印刷が終了したのが表か裏かの情報も同時に記載される。

【0035】プリンタマネージャ101は、プリンタ102から送られた進捗状況を記録してプリンタ102が印刷を終了したページとコピー枚数を常に把握すると共に、この進捗状況を端末装置104の端末画面に表示する（S304）。例えば、「印刷終了枚数：X、；コピー終了枚数：Y」と表示し、プリントジョブの全校数とコピー部数とがわかっている場合は、予想終了時刻をも表示する。

【0036】その後、プリンタマネージャ101は、プリンタ102から印刷完了の通知を受け（S305）、端末装置104に印刷の完了を通知し（S306）、イベント処理を終了する。

【0037】なお、図3のステップS302において、受信したイベントが印刷ジョブ進捗状況ではない場合はその他のイベント処理を行う（S303）。その他のイベント処理は本発明とは直接関連性がないため、ここではその説明を省略する。

【0038】（障害発生時のプリンタマネージャの処理）次に、プリンタ102に障害が発生した場合の動作を説明する。なお、障害とは、例えば紙詰まり、用紙切

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れ等、プリンタが印刷を継続することができない全ての場合を含むものとする。

【0039】図3のステップS301において、プリンタマネージャ101は、プリンタから送信されたイベントからプリンタに障害が発生したことを検知する。続いてプリンタマネージャ101は、印刷ジョブ設定で選択された障害発生時の対応策を確認する。例えば、障害発生時の対応策として「障害が発生したら直ちに代理プリンタに切り替えて継続する」が選択されている場合、ステップS308に進み、障害回避処理を開始することを決定する。また、例えば、障害発生時の対応策として「障害発生後、X分以内に障害が解決されなかったら代理プリンタに切り替える」が選択されている場合、ステップS307で障害回避タイマを起動させ、所定の時間、障害回避処理の開始を待つ。

【0040】ステップS308において障害回避処理の開始を決定した後、プリンタマネージャ101は、障害が発生したプリンタ102にジョブ廃棄命令を通知し（S309）、障害が解除された後に残りのデータが印刷されないようにする。

【0041】図2に戻り、障害回避処理の続きを説明する。ステップS213において、プリンタマネージャ101は、印刷ジョブ設定に基づいて代理プリンタを決定する。ここではプリンタ103が代理プリンタとして使用される。

【0042】プリンタマネージャ101は、決定した代理プリンタ103が印刷ジョブを実行可能か否かを判断する（S214）。代理プリンタ103が印刷ジョブを実行可能な状態にあれば、代理プリンタ103に対してプリンタジョブ設定を送信し、プリンタジョブ設定を行う（S217）。このプリンタジョブ設定とは、障害が発生したプリンタに送った設定に「PDLデータ読み飛ばしモード」を選択するフラッグと、障害が発生したプリンタが最後に転送して来た進捗状況報告イベントを追加したものである。なお、「PDLデータ読み飛ばしモード」とは、後述するプリンタの動作モードであって、障害が発生したプリンタが最後に転送して来た進捗情報報告イベントを参照し、既に印刷されたページの印刷処理を行わないようにするモードである。また、代理プリンタ103が選択されたことは、端末装置104の表示画面に表示される。

【0043】一方、ステップS214において、決定した代理プリンタ103が印刷ジョブを実行することができない状態にある場合は、その代理プリンタ103がビジーであるか否かを判断する（S215）。ビジーである場合は、ステップS214に戻ってビジー状態が解消されるのを待つ。ビジーではなく、何らかの理由により印刷ジョブを実行不可能である場合は、別のプリンタを選択し（S216）、ステップS214に戻って処理を続行する。

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【0044】続いてプリンタマネージャ101は、代理プリンタ103からプリンタジョブ設定完了の報告を受け（S218）、代理プリンタに対しPDLデータを転送する（S209）。なお、PDLデータ転送後の処理は、前述した（プリンタマネージャの通常の処理）の項で説明した通りであるため、ここではその説明を省略する。

【0045】[プリンタの動作] 続いてプリンタの動作を（通常の処理）、（障害発生時の処理）及び（代理プリンタの動作）に分けて説明する。図4は、本発明の実施の形態に係るプリントシステムにおいて、プリンタのメインルーチンを示すフローチャートである。

【0046】（通常の処理）印刷ジョブ設定で選択されたプリンタ102は、プリンタマネージャ101から送信されたプリンタジョブ設定を受信し、自身の設定を変更する（S401）。

【0047】プリンタ102は、プリンタジョブ設定に「PDLデータ読み飛ばしモード」のフラッグが存在するか否かを判断する（S402）。ここでは「PDLデータ読み飛ばしモード」のフラッグが存在しないものとしてステップS404に進み、プリンタマネージャ101に対しプリンタジョブ設定終了の報告を送信する。

【0048】そして、プリンタマネージャ101から送信されたPDLデータを受信し、PDLデータをページ毎に処理する（S405）。まず、PDLデータに基づいてページイメージを作成し（S406）、記録紙に印刷する（S408）。印刷された記録紙が排紙されたことを検知すると（S409）、進捗状況報告イベントをプリンタマネージャ101に対して送信する（S410）。すなわち、進捗情報報告イベントは、紙を1枚排紙する毎にプリンタマネージャ101に対して出力される。

【0049】ここで、進捗状況報告イベントを詳細に説明する。進捗状況報告イベントは、 $Pn-Cn-Sn-Fn-Tn$ という形式で表記される。ここで Pn はPDLデータで定義されるページの番号であり、 Cn はコピー部数番号である。 Sn は印刷される紙の番号であり、ページ番号やコピー部数に関係なくプリンタが操作する順番に紙に連番が付けられる。 Fn は紙の面の番号であり、例えば0が表で1が裏を表示する。 Tn は排紙トレイの番号である。

【0050】PDLデータは、プリントするデータを1ページ目から順番に定義するものである。つまり n ページ分のデータは、 $P1, P2, P3, \dots, Pn$ と並んでおり、これらのページはこの順番で紙 $S1, S2, S3, \dots, Sn$ に印刷されていく。なお、両面印刷の場合は $P1$ が $S1$ の表に印刷され、 $P2$ が $S1$ の裏にそれぞれ印刷される。よって、進捗状況報告イベントは具体的に、

$P1-C1-S1-F1-T1,$

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P2-C1-S2-F1-T1,
 P3-C1-S3-F1-T1,

 Pn-C1-Sn-F1-T1
 と表記される。

【0051】また、プリントジョブ設定にm部のコピー部数が指定されている場合（自動的にソータが使用される）であり、かつ片面印刷の場合、P1-1, P1-2, P1-3, ... Pn-m, P2-1, P2-2, P2-3, ..., Pn-mというページデータがS1, S2, S3, ..., Snxmの紙に印刷される。したがって進捗情報報告イベントは、

P1-C1-S1-F1-T1,
 P1-C2-S2-F1-T2,

 P1-Cm-Sm-F1-Tm,
 P2-C1-S(m+1)-F1-T1,
 P2-C(m+2)-S1-F1-T2,

 P1-Cm-S(2m)-F1-Tm,
 と表記される。

【0052】両面印刷の場合、P1-1とP2-1とがS1, P1-2とP2-2とがS2, ... P(n-1)-mとPn-m(nが偶数の場合)又はPn-1(nが奇数の場合)のページデータがSnmに印刷される。したがって、進捗状況報告イベントは、

P1-C1-S1-F1-T1,
 P2-C1-S1-F2-T1,
 P1-C2-S2-F1-T2,
 P2-C2-S2-F2-T2,

 と表記される。

【0053】つまりプリンタは、紙が1枚排紙される度に「PDLのpページ目のデータのc番目のコピーをs番目の紙に印刷して、t番の排紙トレイに排紙した」又は「PDLのpページ目とp+1ページ目のデータのc番目のコピーをs番目の紙に印刷して、t番の排紙トレイに排紙した」ということをプリンタマネージャ101に対して報告する。ただし、上記進捗状況報告イベントの表記方法はあくまで例であって、表記方法はプリンタのメカニズム、例えば両面印刷の方法によって変化するものである。

【0054】プリンタ102は、進捗状況報告イベントの通知を行った後、PDLデータが終了であるか否かを判断する(S411)。PDLデータが終了していない場合は、ステップS405に戻って上述した処理を実行する。一方、PDLデータが終了した場合は、プリンタマネージャ101に対してジョブ終了通知を送信し(S412)、印刷ジョブを終了する。

【0055】(障害発生時の処理)次に、プリンタに紙

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詰まりが発生したものとして障害発生時のプリンタの動作を説明する。プリンタ102は、紙詰まりが発生したことを検知すると、障害発生報告イベントを送信し、プリンタマネージャ101に対して障害が発生したことを通知する(S413)。

【0056】その後、障害が解除された場合はステップS408に進み、印刷を継続する(S414)。一方、障害が解除されない場合はプリンタマネージャ101からの印刷ジョブ廃棄命令を待つ(S415)。印刷ジョブ廃棄命令を受信した場合、プリンタ102は障害によって中断された印刷ジョブを破棄すると共に、印刷ジョブを廃棄した旨をプリンタマネージャ101に通知し(S416)、ジョブを終了する。

【0057】(代理プリンタの動作)上述したように、印刷ジョブを実行中のプリンタ102に障害が発生した場合、プリンタマネージャ101は予め設定した印刷ジョブ設定に従って代理プリンタを決定する。代理プリンタに決定されたプリンタ103は、プリンタマネージャ101から送信されたプリンタジョブ設定を受信し、自身の設定を変更する(S401)。なお、このプリンタジョブ設定には、障害が発生したプリンタ102に対して送った設定に加え、「PDLデータ読み飛ばしモード」を選択するフラッグと、障害が発生したプリンタ102が最後に送信してきた進捗状況報告イベントとが追加されたものである。

【0058】代理プリンタ103は、プリンタジョブ設定から「PDLデータ読み飛ばしモード」を選択するフラッグを検知すると(S402)、プリンタジョブ設定に設定された進捗状況報告イベントに従い読み飛ばしページ番号を設定する(S403)。すなわち、読み飛ばしページ番号を設定することにより、障害が発生したプリンタ102が既に印刷したページの印刷処理を実行しないようにする。その後、代理プリンタ103は、プリンタマネージャ101に対して設定が完了した旨を通知する(S404)。

【0059】続いて、プリンタマネージャ101から送信されたPDLデータを受信し、PDLデータをページ毎に処理する(S405)。まず、PDLデータに基づいてページイメージを作成する(S406)。続いてページイメージを作成したページと設定した読み飛ばしページ番号とを比較する(S407)。例えば、作成したページイメージがPDLデータの1ページ目で、読み飛ばしページ番号が3ページと設定されている場合、作成したページイメージは既に障害が発生したプリンタ102で印刷が終了しているため、記録紙へは印刷せず、ステップS410に進んで進捗状況報告を行う。

【0060】一方、例えば作成したページイメージがPDLデータの4ページ目で、読み飛ばしページ番号が3ページと設定されている場合、作成したページイメージはまだ印刷されていないため、記録紙へ印刷し(S40

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8)、記録紙を排紙した後(S409)、進捗状況報告を行う(S410)。代理プリンタ103の動作において、障害が発生した場合の動作を含むその他の動作については、(通常の処理)及び(障害発生時の処理)で説明したものと同様であるのでその説明を省略する。

【0061】なお、障害が発生したプリンタ102と代理プリンタ103とが同じ機種である場合、代理プリンタ103は障害が発生したプリンタ102と同様の処理を行うことができるため、排紙トレイの選択、表・裏の印刷処理等も問題なく行うことができる。

【0062】一方、障害が発生したプリンタ102と代理プリンタ103とが異なる機種である場合であって、プリントジョブ設定として両面印刷でコピー部数が複数に設定されている場合は、プリンタによって印刷する順序が異なることがある。この場合、代理プリンタ103は、「障害が発生したプリンタが印刷を終了した紙を印刷しない」とはならず、「障害が発生したプリンタが処理を完全に終了した偶数ページ分のPDLデータ」を印刷しないという処理を行うことにより、プリンタの印刷機構が異なっている場合でも、途中の数ページが印刷されないということを防ぐことができる。

【0063】このように本発明の実施の形態に係るプリントシステムによれば、印刷ジョブを実行中のプリンタ102に障害が発生した場合、それまでに印刷が終了した分を無駄にせず、残りを別の代理プリンタ103で印刷することによって、人間の介在なしで印刷ジョブを終了可能にすることができる。また、障害発生時の対応策は、「しない」、「直ちに代理プリンタに切り替える」、「障害発生後、N分以内に障害が解消されなかったら代理プリンタに切り替える」等の数種類の中から選択することができるため、印刷ジョブの重要度に合わせて障害発生時の対応策を選択することができ、非常に便利である。

【0064】

【発明の効果】以上説明したように、本発明に係るプリントシステム(請求項1)によれば、印刷ジョブを実行中のプリンタに障害が発生したことを検知し、予め定めた障害発生時の対応策に基づいてプリンタに代わる代理プリンタを選択すると共に、代理プリンタに対して印刷ジョブと障害が発生したプリンタが既に印刷を終了した

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ページ情報とを送信するプリンタ管理手段と、代理プリンタとして選択された場合、プリンタ管理手段から印刷ジョブとページ情報とを受信し、ページ情報に基づいて、既に実行された印刷ジョブの続きを実行するプリンタと、を備えているため、障害が発生したプリンタで既に印刷が終了した分を無駄にすることなく、代理プリンタで印刷ジョブを完了することができる。

【0065】また、本発明に係るプリントシステム(請求項2)によれば、請求項1記載のプリントシステムにおいて、プリンタ管理手段が、複数の障害対応策を記憶しており、印刷ジョブを実行中のプリンタに障害が発生する前に複数の障害対応策の中から障害対応策を予め選択しておくことにしたため、障害回避の方針を任意に変更することが可能となる。

【0066】更に、本発明に係るプリントシステム(請求項3)によれば、請求項1記載のプリントシステムにおいて、プリンタ管理手段が、印刷を実行中のプリンタに障害が発生した場合、当該プリンタに対して印刷ジョブの廃棄命令を通知し、プリンタが、廃棄命令の通知を受信し、印刷ジョブを廃棄することにしたため、代理プリンタに残りの印刷ジョブを続行させたにも拘らず、障害が発生したプリンタの障害が解除された後に同一データが印刷されるということを防ぐことができる。

【図面の簡単な説明】

【図1】本発明の実施の形態に係るプリントシステムの概略構成を示す構成図である。

【図2】本発明の実施の形態に係るプリントシステムにおいて、プリンタマネージャのメインルーチンを示すフローチャートである。

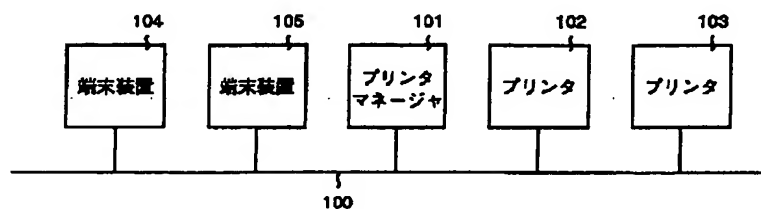
【図3】本発明の実施の形態に係るプリントシステムにおいて、プリンタマネージャのイベント処理ルーチンを示すフローチャートである。

【図4】本発明の実施の形態に係るプリントシステムにおいて、プリンタのメインルーチンを示すフローチャートである。

【符号の説明】

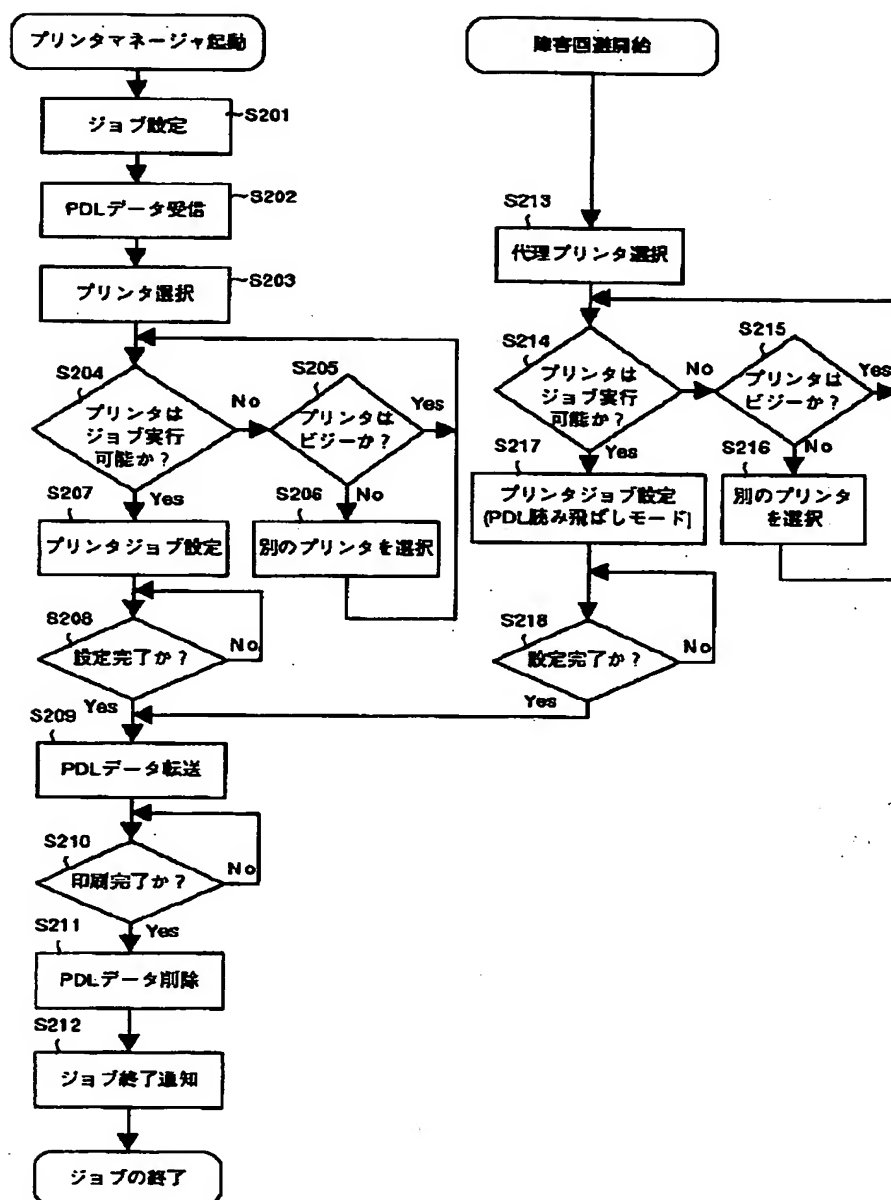
100 ネットワーク
101 プリンタマネージャ
102, 103 プリンタ
104, 105 端末装置

【図1】



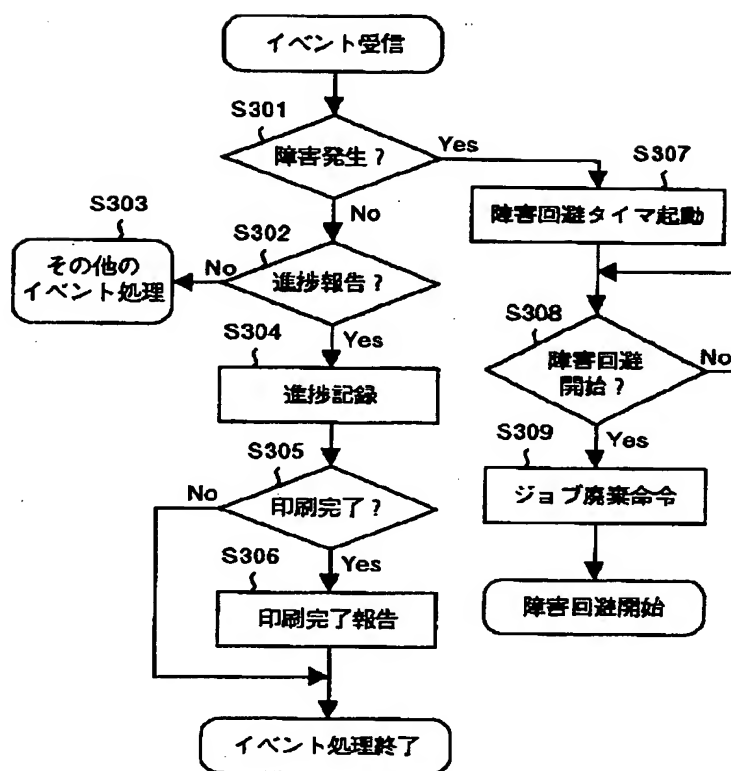
(8)

【図2】



(9)

【図3】



(10)

【図4】

